



AUTO-TRACKING WITH DIGITAL CONTROL  
COLOR DISPLAY MONITOR

MODEL

**HC3915 R/RV SERIES**

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USER'S GUIDE

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**注 意**

本品は外国為替及び外国貿易管理法に定める  
戦略物資（又は役務）に該当するため、輸出す  
る場合、同法に基づく輸出（又は役務取引）許  
可が必要です。

**CAUTION**

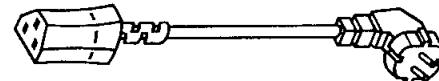
These products or technologies are subject to  
Japanese and/ or COCOM strategic restrictions,  
and diversion contrary thereto is prohibited.

## **Attached power cords**

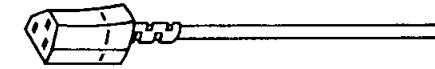
Two following power cords are supplied with display monitor.

If you can not use a cord with plug (Eur. 220V). Please use another one without plug (U.K. 240V) and connect the plug with earth suitable for your area.

**Europe:220V**



**U.K.:240V**



CP870D004A10

## **CAUTION**

- \* The detachable power supply cord designed for safety is provided with this set.  
It is to be used with a properly grounded power receptacle to avoid possible electrical shock.
- \* Do not remove the back cover of the set as this can expose you to very high voltages and other hazards.
- \* Please use shielded cables as signal cables for preventing interference to radio communications.

For Model HC3915RV Series:

### **HERSTELLER-ERKLÄRUNG ZUR ALLGEMEINEN GENEHMIGUNG NACH DEM HOCHFREQUENZGERÄTEGESETZ**

Bescheinigung des Herstellers

Hiermit wird bescheinigt, daß der  
Monitor HC3915ATRV

(Gerät, Typ, Bezeichnung)  
in Übereinstimmung mit den Bestimmungen der  
Vfg. 1046/84

(Amtsblattverfügung)  
funk-entstört ist.

Der Deutschen Bundespost wurde das Inverkehrbringen  
dieses Gerätes angezeigt und die Berechtigung zur  
Überprüfung der Serie auf Einhaltung der Bestimmungen  
eingeräumt.

**MITSUBISHI ELECTRIC CORPORATION**

Name des Herstellers

2-3 MARUNOUCHI 2-CHOME CHIYODAKU  
TOKYO 100, JAPAN

### **ANWENDUNGS HINWEIS**

GEMÄSS POSTVERFÜGUNG 1046/84 MÜSSEN WIR  
DARAUF HINWEISEN, DASS BEI DER  
ZUSAMMENSCHALTUNG DIESES GERÄTES MIT  
ANDEREN ANLAGEN ODER ANLAGETEILEN DIE  
EINHALTUNG DER FUNKSTÖRGRENZWERTE NACH  
VDE 0871 GRENZWERTKLASSE B FÜR DIE  
GESAMTE ANLAGE SICHERGESTELLT WERDEN  
MUSS.

ZUR VERBESSERUNG  
DER RADIOFREQUENTEN STÖRSTRÄHLUNG  
EMPFEHLEN WIR FÜR DIE VERBINDUNG ZWISCHEN  
PC UND MONITOR DIE BENUTZUNG DES  
ABGESCHIRMEN KABELS.

SIGNALPEGEL: ABGESCHIRMTE-KABEL

## WARNING

### RADIO INTERFERENCE REGULATIONS STATEMENT FOR U.S.A.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

### RADIO INTERFERENCE REGULATIONS STATEMENT FOR CANADA

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

### VCCI 適合宣言

この装置は、第一種情報装置（商工業地域において使用されるべき情報装置）で商工業地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。

従って、住宅地域またはその隣接した地域で使用すると、ラジオ、テレビジョン受信機等に受信障害を与えることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

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# 1. INTRODUCTION

1

Compatible to the IBM system. The size and position of the picture to operate the IBM system (VGA) are automatically adjusted. In addition, manual adjustment to the other computer can be available with the buttons on the right side panel of the unit.

2

Video signal can be input on a shrinked D-SUB 15P connector or BNC connector: RGB separate (8 colors and 16 colors pastel/saturation), RGB R'G'B' TTL separate (64 colors), and RGB analog signals. In addition, TTL text mode can be used by switching the mode switch on the rear panel to "TEXT" position.

3

Automatic tracking and synchronization over a wide range of horizontal (15.7 – 38.0 kHz) and vertical (45 – 90 Hz) scanning frequencies.

# 2. INSTALLATION

## 1. Connecting an IBM or IBM-compatible computer.

For connection of the TTL signals such as EGA, as shown, use the cable (optional extra) with a 9-pin D-SUB type.

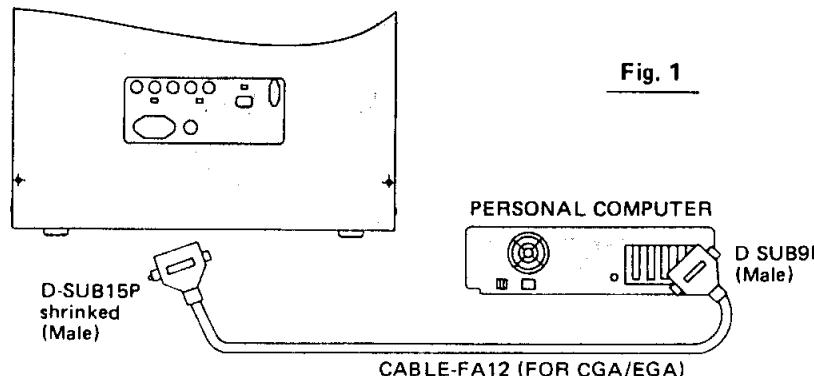
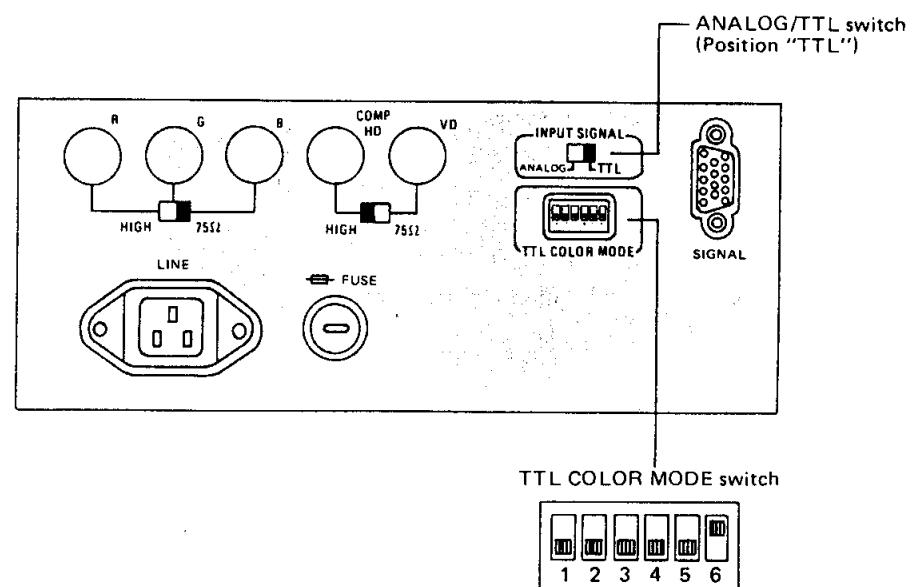


Fig. 1



## INSTALLATION

2. Connecting an IBM Personal System/2 or IBM-compatible computer.  
For connection as shown, use the cable (optional extra) with a 15-pin shrinked D-SUB type.

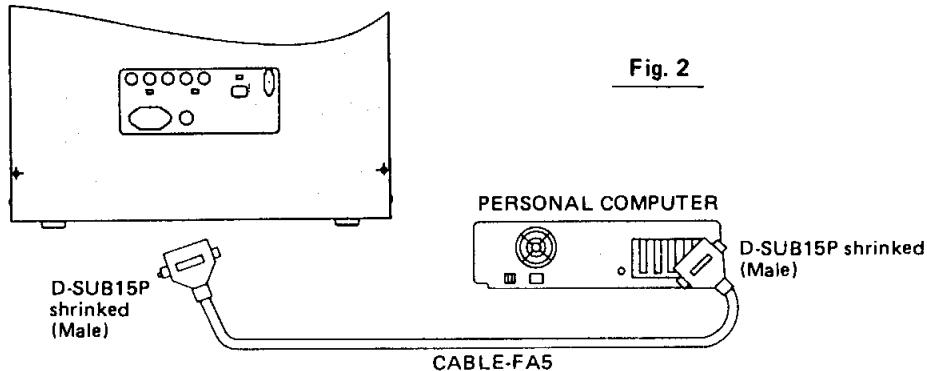
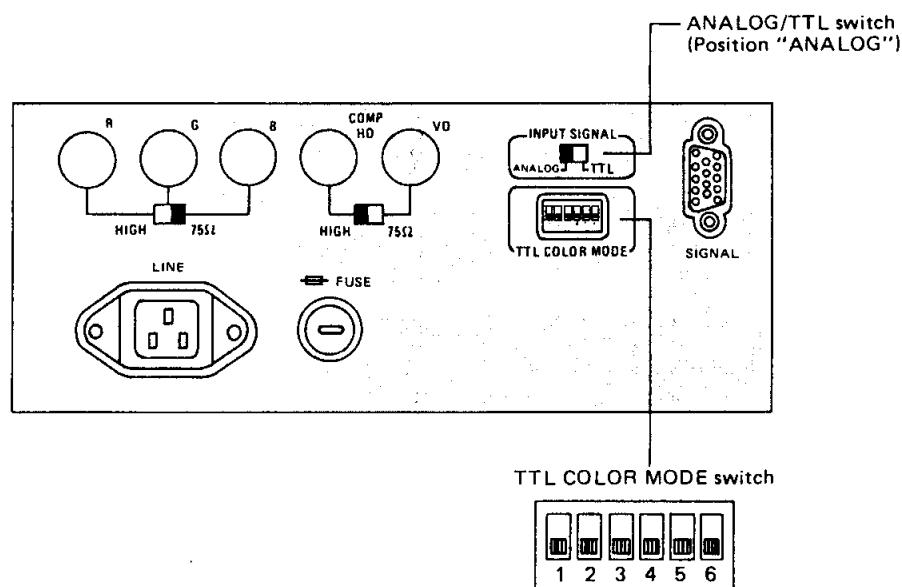


Fig. 2



3. Connecting the APPLE personal computer II GS and MAC II.  
For connection as shown, use the cable (optional extra) with a 15-pin D-SUB type.

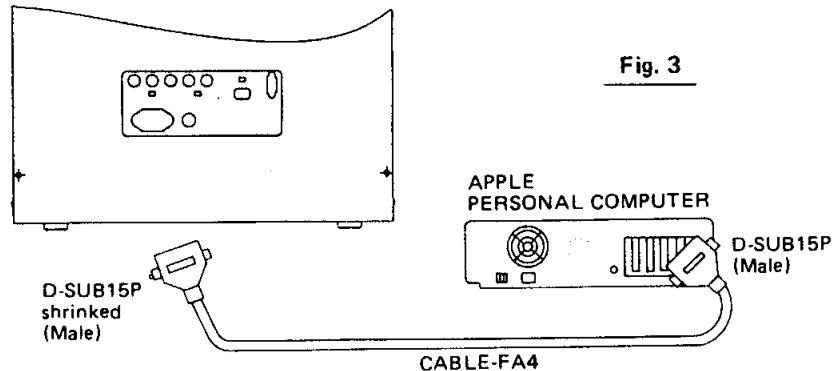
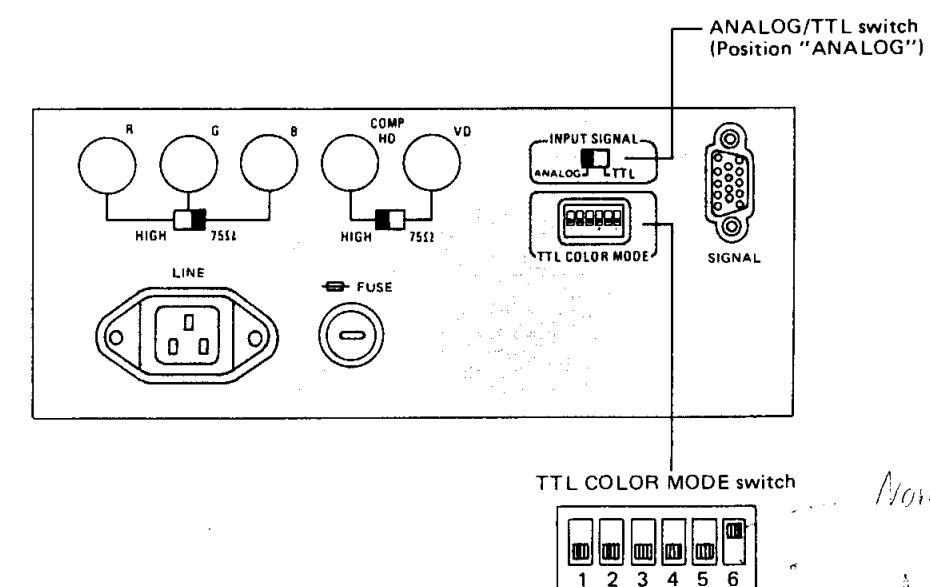


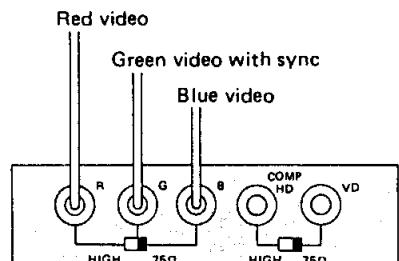
Fig. 3



# INSTALLATION

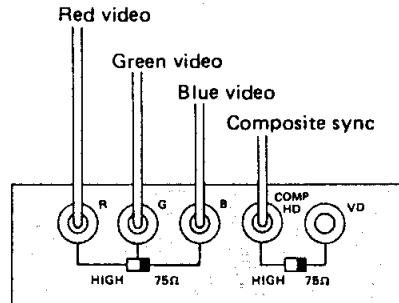
## 4. Connection of Signal Cables with BNC connector

### (1) In case of COMPOSITE SYNC ON GREEN VIDEO



(Rear Panel)

### (2) In case of EXTERNAL COMPOSITE SYNC



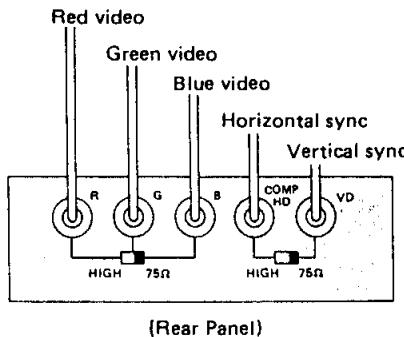
(Rear Panel)

If your generator or the controller in your computer can output the sync signal into  $75\Omega$ , set this switch to  $75\Omega$  side.

In case of TTL level sync signal, set this switch to HIGH side.

# INSTALLATION

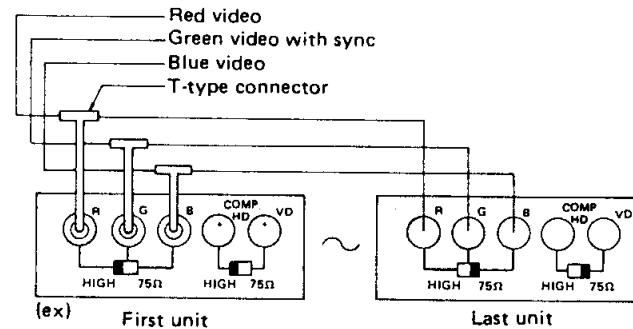
### (3) In case of EXTERNAL SEPARATE SYNC



(Rear Panel)

Please refer to item (2) of this section for setting this switch.

### (4) In case of LOOP-THROUGH-STRINGS



- For keeping fine quality of the picture, please avoid connecting 4 monitors or more as a loop through strings.
- The input impedance selector switches of the units in a loop-through-strings should be set to "HIGH" side.
- The input impedance selector switches of the last unit in a loop-through-strings should be set to " $75\Omega$ " side to terminate signal cables.
- The signal cable should be made with 75 ohm shielded coaxial cable. (Type RG59/U or equivalent)

### 3. USER CONTROLS

Power up all equipment. Use your computer system operation guide for instructions on powering your computer and other peripherals.

Front view

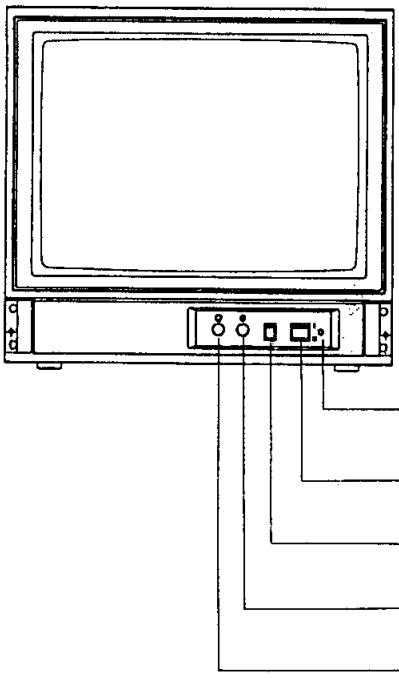


Fig. 4

### USER CONTROLS

#### ① POWER-ON INDICATOR

This indicator illuminates when the power is on.

#### ② POWER ON/OFF SWITCH

The power ON/OFF Switch is a seesaw switch.

Press the switch to power on.

Press the switch to power off.\*

#### ③ DEGAUSS SWITCH

Manual degauss type.

- Press and hold the button until the color distortion disappears (approx. 10 seconds)
- Release it.

#### ④ CONTRAST CONTROL

Turn clockwise for deeper contrast.

#### ⑤ BRIGHTNESS CONTROL

Turn clockwise for greater brightness.

\*Please refrain the power on and off excessively, it can be a cause of fires, damage and/or electrical shocks.

## USER CONTROLS

### • REPLACE OF FUSE

Please replace the fuse as Fig. 5.

### WARNING

FOR CONTINUED PROTECTION AGAINST RISK OF FIRE  
REPLACE ONLY WITH SAME TYPE AND RATINGS OF FUSE.

#### Fuse Rating:

Model HC3915R series:

UL and CSA Type, 3.5A, 250V, Time Delay

Model HC3915RV series:

IEC Type, T3.15A, 250V, Time Lag

Size: 20mm Long by  $\phi$  5.2

#### Rear view

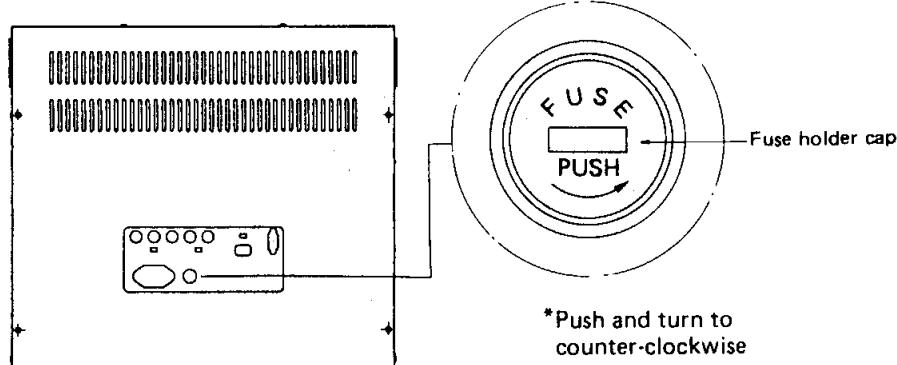
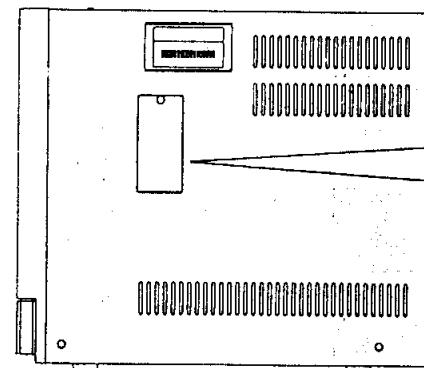


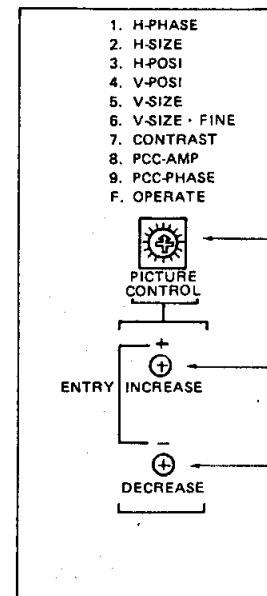
Fig. 5

## 4. CALIBRATION CONTROLS

### Right side view



### SIDE LID CONTROLS



⑥ PICTURE CONTROL

⑦ ADJUSTMENT BUTTON  
(INCREASE)

⑧ ADJUSTMENT BUTTON  
(DECREASE)

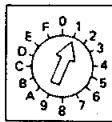
## CALIBRATION CONTROLS

### ⑥ PICTURE CONTROL

Select necessary number as you adjust the picture dimensions.  
Numbers present following adjustment items.

0	SPARE	
1	H-PHASE	
2	H-SIZE	
3	H-POSITION	
4	V-POSITION	
5	V-SIZE	
6	V-SIZE-FINE	
7	CONTRAST	
8	PCC-AMP	
9	PCC-PHASE	
A ~ E	SPARE	
F	OPERATE	NORMAL POSITION

Re-adjust these items  
according to the  
input signal timing.



## CALIBRATION CONTROLS

### ⑦ ADJUSTMENT BUTTON (INCREASE)

### ⑧ ADJUSTMENT BUTTON (DECREASE)

When ADJUSTMENT BUTTON ⑦ or ⑧ is pushed, motions of  
adjustment items are as follows.

BUTTON ⑦	BUTTON ⑧
WIDEN	NARROW
SHIFT TO RIGHT	SHIFT TO LEFT
UP	DOWN
BRIGHT	DARK

### ENTRY

Color mode switch No. 6 set to "NORMAL POSITION" and after  
the adjustment, push ⑦ and ⑧ at same time when you make  
entry of new timing into the internal memory.

\* It is able to entry 6 mode signals under the following conditions.

Ⓐ Deviation of each horizontal frequency should be kept  
2 KHz or more.

OR

Ⓑ Deviation of each vertical frequency should be kept Table  
A.

OR

Ⓒ The combination of the sync polarity for horizontal and  
vertical should be different.

CAUTION: When 7'th signal is entered, the 1st signal is lost.

Vertical frequency	Deviation
45 Hz ~ 55 Hz	5 Hz or More
55 Hz ~ 65 Hz	7 Hz or More
65 Hz ~ 75 Hz	10 Hz or More
75 Hz ~ 90 Hz	15 Hz or More

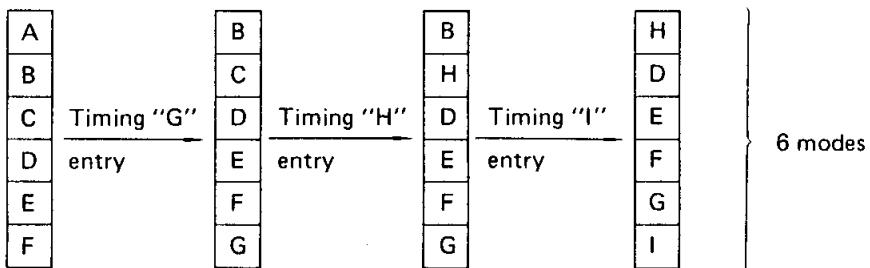
TABLE A

## CALIBRATION CONTROLS

<for example>

fH	fV	H-Sync	V-Sync	
31.5 KHz	60 Hz	+	+	
31.5 KHz	60 Hz	+	-	
31.5 KHz	60 Hz	-	+	
31.5 KHz	60 Hz	-	-	no-problem

31.5 KHz	60 Hz		
29.5 KHz	60 Hz		
29.5 KHz	50 Hz		no-problem



## CALIBRATION CONTROLS

ADJUSTMENT ITEMS	⑥ PICTURE CONTROL	⑦ · ⑧ ADJUSTMENT BUTTON	CONTROLS
3. HORIZONTAL RASTER POSITION		⑦ INCREASE ⑧ DECREASE	 
4. VERTICAL PICTURE POSITION		⑦ INCREASE ⑧ DECREASE	 
5. VERTICAL PICTURE SIZE		⑦ INCREASE ⑧ DECREASE	 

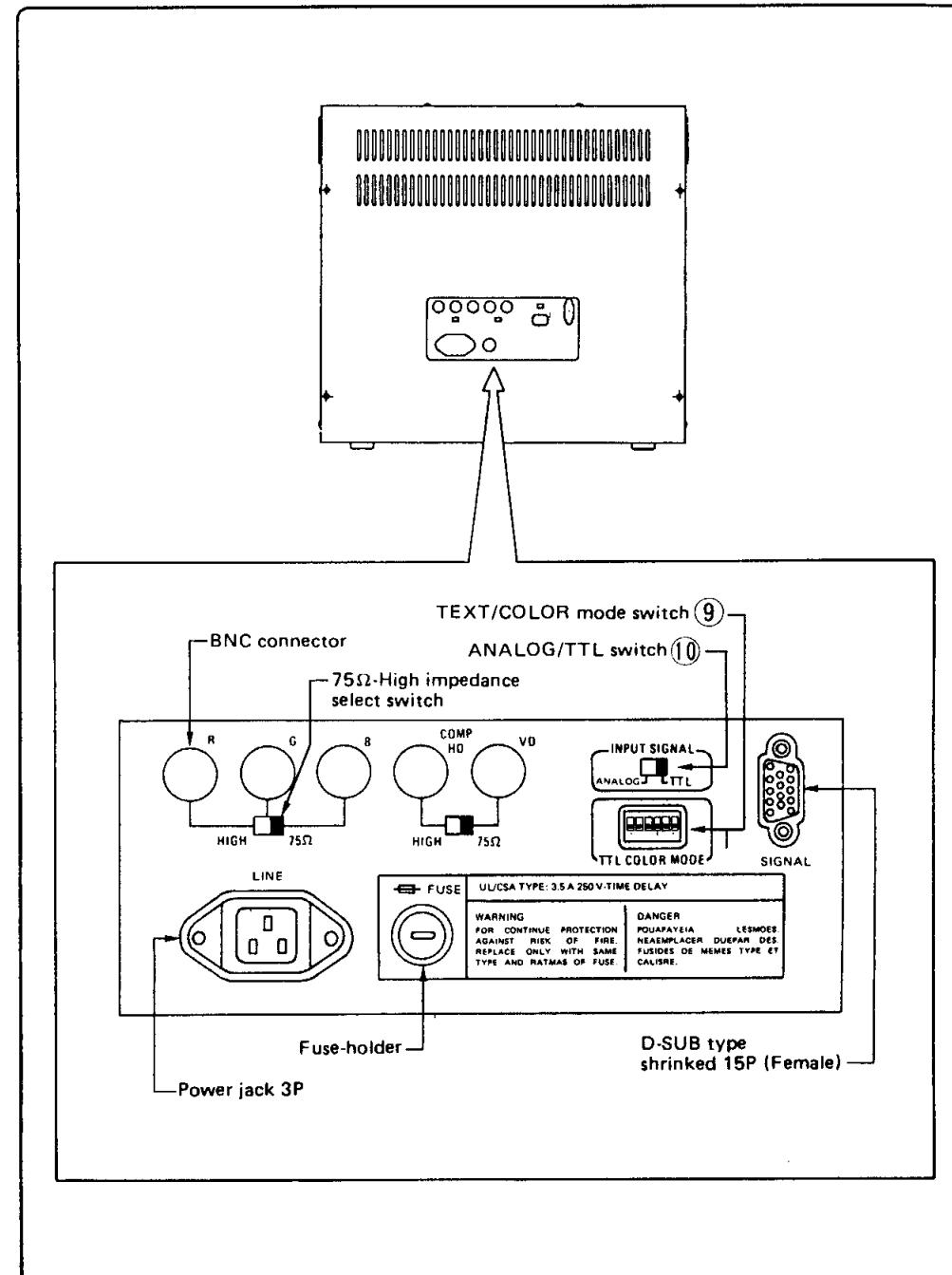
## CALIBRATION CONTROLS

ADJUSTMENT ITEMS	⑥ PICTURE CONTROL	⑦ · ⑧ ADJUSTMENT BUTTON	CONTROLS
6. VERTICAL PICTURE FINE-SIZE		⑦ INCREASE ⑧ DECREASE	 
7. CONTRAST		⑦ INCREASE ⑧ DECREASE	 
8. SIDE PIN CUSHION GAIN		⑦ INCREASE ⑧ DECREASE	 

## CALIBRATION CONTROLS

ADJUSTMENT ITEMS	⑥ PICTURE CONTROL	⑦ , ⑧ ADJUSTMENT BUTTON	CONTROLS
9. SIDE PIN CUSHION PHASE		⑦ INCREASE  ⑧ DECREASE	
F. NORMAL OPERATION		—	—

## CALIBRATION CONTROLS



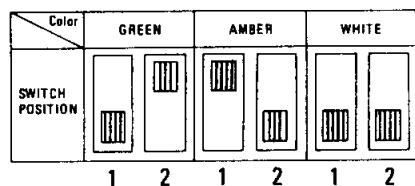
## CALIBRATION CONTROLS

### ⑨ TTL COLOR MODE SWITCH

COLOR MODE SELECT SWITCH (SWITCH 1 ~ 4)

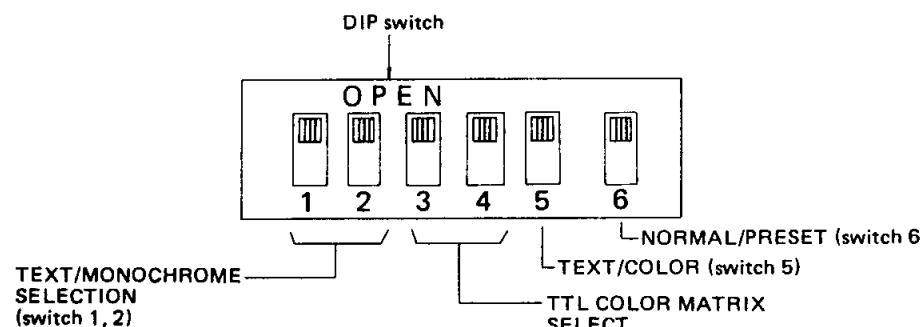
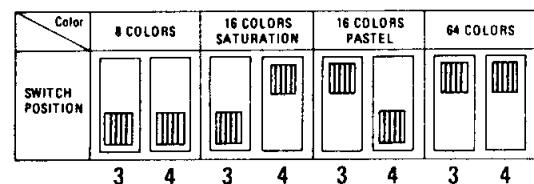
#### 1. TEXT/MONOCHROME SELECTION (SWITCH 1, 2)

This can be on TTL Mode and SELECT three color on the TEXT position. Examples of selection is following switch position.



#### 2. TTL COLOR MATRIX SELECT (SWITCH 3, 4)

This can be select following 4 colors when you select COLOR switch on TTL mode prior to connecting with your personal computer.

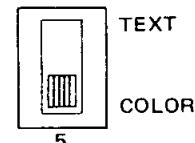


**Fig. 6**

## CALIBRATION CONTROLS

### (1) TEXT COLOR SWITCH (SWITCH 5)

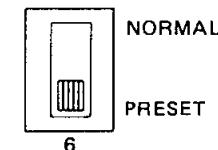
This can be used on TTL mode only, and has 3 text colors of green, amber & white.



### (2) NORM./PRESET SWITCH (SWITCH 6)

At the PRESET position, the monitor shall automatically correct and follow the size position and colors of pictures of IBM system (8514, VGA).

At the NORM. position, the monitor shall automatically correct according with your entry timing and the TTL color mode of 16 saturation/pastel and 64 colors can be selected manually in order to meet other PC's modes.



### ⑩ ANALOG/TTL SWITCH

Used to select an input video signal – either TTL or ANALOG – of the graphics adapter.

It is important to determine whether the input signal of the graphics adapter being used is ANALOG or TTL prior to connecting the adapter with your personal computer. Refer to instructions accompanying the graphics adapter for information on the input signal.

## 5. CONNECTION METHODS FOR VARIOUS INPUTS

### Recommended Signals

#### Interface for D-SUB 15p Shrinked

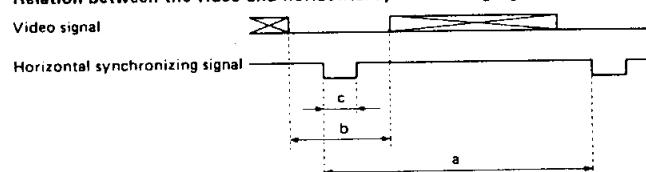
(TTL input)	Video signal	TTL level (positive polarity)
	Synchronizing signal	TTL level (polarity unrelated)
(Analog input)	Video signal	Conformable to 0 ~ 0.7V, 75Ω
	Synchronizing signal	TTL Level (polarity unrelated) TTL Level (negative polarity) Composite H/V 0.3V analog level at Syc. on Green (negative polarity)

#### (Analog input)

#### Interface for BNC (Receptacle)

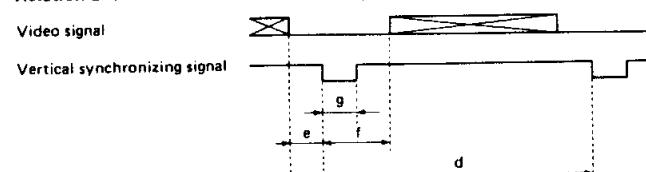
Video signal	Analog R.G.B. 0.7 Vp-p (STD) Positive white
Synchronizing signal	Composite sync on Green video 0.3 Vp-p (STD)
	Composite sync 1.5 ~ 5.0 Vp-p
	HD. VD. 1.5 ~ 5.0 Vp-p
Input connector	BNC (Receptacle)
Input impedance	75Ω for video and sync signal High impedance can be selected by impedance Select SW. Loop-through operation is available with T-type BNC connector.

#### ○ Relation between the video and horizontal synchronizing signals



- (a) Horizontal period (1/f): 26.31 μsec ~ 64 μsec.
- (b) Blanking: MIN 5.1μsec at normal scan.
- (c) Width of horizontal synchronizing pulse: MIN 1μsec, MAX 7μsec.

#### ○ Relation between the video and vertical synchronizing signals



- (d) Vertical frequency: 11.1 msec ~ 22 msec.
- (e) Front porch: MIN 0msec.
- (f) Back porch: MIN 0.62msec.
- (g) Width of vertical synchronizing pulse: MIN 50μsec, MAX 300μsec.

## 6. QUICK CHECK

Below are some common problems you may encounter. Refer to this checklist before contacting a service technician.

#### 1. Monitor screen is blank, (or white)

- A. Check brightness control; adjust to maximum brightness by turning the control completely clockwise.
- B. Check power.
  - a. Verify that the power-on indicator on the front of the monitor is illuminated.
  - b. See that the monitor power on/off switch is in the on position.
  - c. Check whether the power cord is plugged into the electrical outlet.
  - d. Confirm that the wall power socket is active and works properly.
  - e. If all the above have been checked, unplug the power cord for 30 seconds, re-connect it and re-try the monitor power switch.

#### C. Check connections.

- a. Check that the computer's power is on.
- b. See that the RGB connector cable is securely plugged into the computer interface unit (monitor controller board).
- c. Verify that the RGB connector cable is plugged into the correct controller inside the computer.
- d. Confirm that the controller is properly installed inside the computer.

#### 2. Monitor screen image is dim.

- A. Check brightness control; adjust to maximum brightness by turning the control completely clockwise.

### NOTICE

Under the condition of maximum brightness (fully clockwise of Brightness control: ) and maximum contrast (fully clockwise of contrast control: ), too much input video signal may cause smeared characters, or fuzzy outline of pictures.

In such cases, please turn down Contrast control ( ), or brightness control ( ) if necessary.

## 7. CARE AND MAINTENANCE

Provided the monitor is connected to the proper power source and is handled gently, it should give you a long period of trouble-free productivity. If there is an occasion when you suspect a malfunction with the unit, unplug the set and have it checked by your qualified service technician under conditions such as:

- The set has been dropped or the cabinet has been damaged.
- The power supply cord is damaged or frayed.
- The set has been exposed to rain or water.

If you are unable to restore normal operation by following the procedures in this guide, do not attempt any further adjustments as improper adjustment of other controls will result in damage. Unplug the set and call your dealer.

If the set fails, or exhibits a distinct change in performance, this indicates a need for service. Unplug the set and have it checked by a professional service technician.

It is normal for some sets to make occasional snapping and popping sounds, particularly when being turned on or off. If the snapping or popping is continuous or frequent, unplug the set and consult your dealer.

### Installation and Location Hints

The set has slots in the cabinet and back to provide reliable operation of the monitor and for ventilation purposes.

- Install the set about 4" (0.1 meters) away from the wall.
- Never cover the slots or openings with cloth or other fabric.
- Never block the bottom ventilation slots of the monitor by placing it on a bed, sofa, rug, etc..
- Never place the monitor in a built-in enclosure, unless proper ventilation is provided.
- Never place the monitor near or over a radiator or heat register.
- Never expose the monitor to rain or excessive moisture and dust as this can be a potential cause of fire or shock hazard.
- Never place the monitor on an unstable monitor cart or stand; the monitor may fall causing damage to the monitor or personal injury. Use only with a cart or stand recommended by the manufacturer.

### Operation

- Operate the set only from the power source indicated on the back of the cabinet.
- To use a power source that is not marked on the back of the monitor will shorten the life of the monitor and cause damage in addition to improper operation.

## CARE AND MAINTENANCE

This monitor is equipped with a three-pronged power plug. To ensure safe operation, this plug must be inserted only into a standard three-prong power outlet which is correctly grounded through normal electrical wiring. Extension cords used with the equipment must be three-wire and be correctly wired to provide connection to the ground. Incorrectly wired extension cords are a major cause of fatalities. The fact that the equipment operates satisfactorily does not imply that the power point is grounded and that the installation is completely safe. For your safety, consult a qualified electrician, if you have any questions.

- Do not overload wall outlets and extension cords as this can result in fire or shock.
- Adjust only those controls that are described in this guide. Improper adjustment of other controls may result in damage and could require the services of a technician to restore proper operation.
- Do not allow anything to rest on the power cord. Do not locate this monitor where the cord will be abused by persons walking on it.
- When not using the set for extended periods of time, such as a weekend or vacation, unplug the set from the wall outlet.
- If the same characters or graphics are shown for a long time with the Brightness and Contrast controls set to maximum positions, part of the screen may become damaged. Use these controls with care.
- Do not remove the back cover of the set as this can expose you to very high voltages and other hazards.
- Do not drop or push objects into the cabinet openings. Some internal parts carry hazardous voltages and contact can result in electrical shock or fire.
- Never operate the set near water.
- Never spill liquid of any kind on the monitor. If liquid has accidentally spilled into it, unplug the set and have it checked by a service technician.

### Cleaning

- Always unplug the monitor before cleaning.
- Wipe the screen and cabinet front and sides with a soft cloth.
- If the screen requires more than dusting, apply a household window cleaner to soft cloth to clean the monitor screen.

**Caution** – Do not use benzene, thinner or any volatile substance to clean the unit as the finish may be permanently marked. Never leave the unit in contact with rubber or vinyl for an extended period.

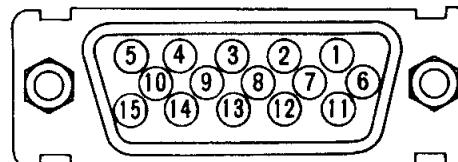
- Occasionally, the internal parts of the monitor may need to be cleaned to prevent fire and other damage caused by dust particles. It is recommended that you take the unit to your dealer for yearly cleaning.

## 8. SPECIFICATIONS

CRT	19" viewable 90 degree deflection 0.31 mm trio dot pitch Clear Glass Polish P22, Short persistence or BL9 Long persistence	
Input Signal	RGB video	TTL Positive 8/16/64 Colors Analog 0.7Vp-p positive
	Sync.	Separate sync. ± HD, ± VD Comp. sync. ± HD/VD Sync. on Green
Signal cable (Option)	Signal cables are prepared for target PCs. Standard option cables were IBM, EGA, VGA and APPLE MAC II and 800 x 600	
Synchronization	Horizontal	15.7 kHz to 38.0 kHz (Automatically)
	Vertical	45 Hz to 90 Hz (Automatically)
Resolution	RGB TTL/ANALOG	
	Horizontal	1280 dots
	Vertical	768 lines
Display Area	Horizontal	350 mm (Nominal)
	Vertical	265 mm (Nominal)
Video Band Width	Dot clock rate 50 MHz (Typical)	
Misconvergence	Less than 0.3mm (Center)	
Power Supply	100 – 120 V ± 10% / 220 – 240 V ± 10%, 50/60 Hz	
Power Consumption	140 W	
Cabinet Dimensions	19 in (W) x 17.44 in (H) x 20.28 in (D) [482 mm (W) x 443 mm (H) x 515 mm (D)]	
Weight	Approximately 78.5 lbs (36 kg)	
Accessory	<ul style="list-style-type: none"> <li>• Power Supply Cord</li> <li>• User's Guide</li> <li>• Fuse</li> </ul>	

## APPENDIX A PIN ASSIGNMENTS AND SIGNAL LEVEL

D-SUB TYPE Shrunked 15P  
(Female)



MOUNTED ON THE REAR PANEL

### STANDARD PIN ASSIGNMENT

PIN ASSIGNMENT	SIGNAL	TTL	ANALOG
1		–	RED GROUND
2		–	RED
3		–	GREEN GROUND
4		–	GREEN
5		–	BLUE GROUND
6	GROUND		GROUND
7	SECONDARY GREEN		–
8	VERTICAL SYNC.		VERTICAL SYNC.
9	HORIZONTAL SYNC.		HORIZONTAL SYNC.
10		–	BLUE
11	GREEN		–
12	SECONDARY RED		–
13	RED		–
14	BLUE		–
15	SECONDARY BLUE		–

## APPENDIX A PIN ASSIGNMENTS AND SIGNAL LEVEL

PIN ASSIGNMENT OF IBM GRAPHICS ADAPTER AND THE OTHER COMPUTER FOR TTL SIGNAL INPUT

SIGNAL PIN ASSGN- MENT	COLOR GRAPHICS TTL 16 COLORS	ENHANCED GRAPHICS TTL 64/16 COLORS	COLOR GRAPHICS TTL 8 COLORS	TTL 16 COLORS	TTL 64 COLORS
1	—	—	—	—	—
2	—	—	—	—	—
3	—	—	—	—	—
4	—	—	—	—	—
5	—	—	—	—	—
6	GROUND	GROUND	GROUND	GROUND	GROUND
7	INTENSITY	SECONDARY GREEN/ INTENSITY	—	INTENSITY	SECONDARY GREEN
8	VERTICAL SYNC.	VERTICAL SYNC.	VERTICAL SYNC.	VERTICAL SYNC.	VERTICAL SYNC.
9	HORIZONTAL SYNC.	HORIZONTAL SYNC.	HORIZONTAL SYNC.	HORIZONTAL SYNC./ H/V SYNC.	HORIZONTAL SYNC./ H/V SYNC.
10	—	—	—	—	—
11	GREEN	PRIMARY GREEN	GREEN	GREEN	PRIMARY GREEN
12	—	SECONDARY RED	—	—	SECONDARY RED
13	RED	PRIMARY RED	RED	RED	PRIMARY RED
14	BLUE	PRIMARY BLUE	BLUE	BLUE	PRIMARY BLUE
15	—	SECONDARY BLUE	—	—	SECONDARY BLUE

ALL SIGNALS ARE TTL

## APPENDIX A PIN ASSIGNMENTS AND SIGNAL LEVEL

PIN ASSIGNMENT AND SIGNAL LEVEL OF IBM GRAPHICS ADAPTER AND THE OTHER COMPUTER FOR ANALOG SIGNAL INPUT

SIGNAL PIN ASSGN- MENT	PRO- FESSIONAL GRAPHICS	SEPARATE SYNC.	COMPOSIT SYNC.	SYNC. ON GREEN
1	RED GROUND	RED GROUND	RED GROUND	RED GROUND
2	*RED	*RED	*RED	*RED
3	GREEN GROUND	GREEN GROUND	GREEN GROUND	GREEN GROUND
4	*GREEN	*GREEN	*GREEN	**GREEN H/V SYNC.
5	BLUE GROUND	BLUE GROUND	BLUE GROUND	BLUE GROUND
6	GROUND	GROUND	GROUND	GROUND
7	—	—	—	—
8	MODE CONTROL	VERTICAL SYNC.	—	—
9	COMPOSITE SYNC.	HORIZONTAL SYNC.	H/V SYNC.	—
10	*BLUE	*BLUE	*BLUE	*BLUE
11	—	—	—	—
12	—	—	—	—
13	—	—	—	—
14	—	—	—	—
15	—	—	—	—

\* . . . . . 0.7Vp-p (VIDEO)

\*\* . . . . . 0.7Vp-p (VIDEO) and 0.3Vp-p (SYNC.)

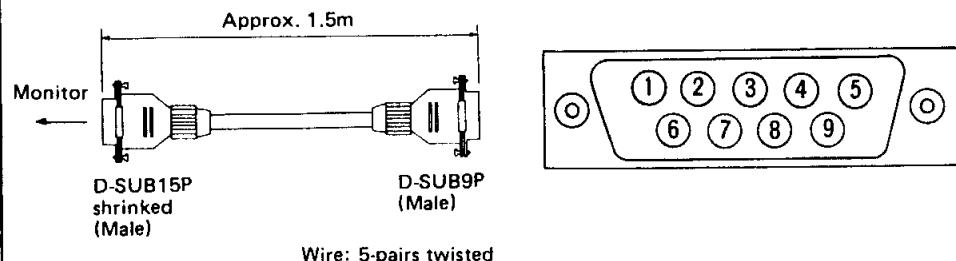
Non-mark . . . TTL

## APPENDIX B STANDARD SIGNAL CABLE

### OPTION

TYPE: CABLE-FA12 (FOR CGA/EGA)

#### PIN ASSIGNMENT AND SIGNAL LEVEL



IBM ADAPTERS (TTL) PIN-ASSIGNMENT	COLOR GRAPHICS TTL 16 COLORS (CGA)	ENHANCED GRAPHICS TTL 64/16 COLORS (EGA)
1	GROUND	GROUND
2	GROUND	SECONDARY RED
3	RED	PRIMARY RED
4	GREEN	PRIMARY GREEN
5	BLUE	PRIMARY BLUE
6	INTENSITY	SECONDARY GREEN/INTENSITY
7	NC	SECONDARY BLUE
8	HORIZONTAL SYNC.	HORIZONTAL SYNC.
9	VERTICAL SYNC.	VERTICAL SYNC.

NC . . . . . NON-CONNECTION

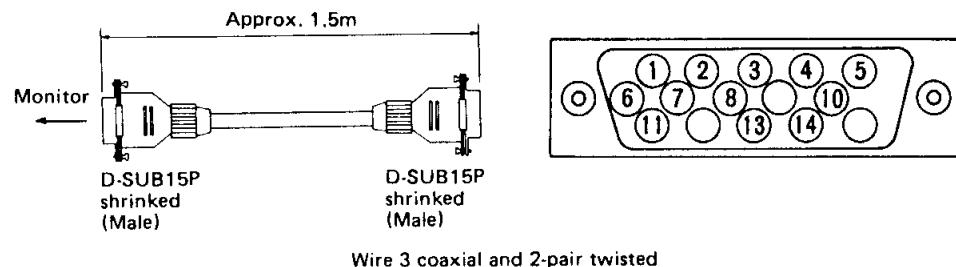
SIGNAL . . . TTL

## APPENDIX B STANDARD SIGNAL CABLE

### OPTION

TYPE: CABLE FA5 (FOR VGA/8514A/800 × 600)

#### PIN ASSIGNMENT AND SIGNAL LEVEL



SIGNAL PIN ASSIGNMENT	ANALOG
1	*RED
2	*GREEN
3	*BLUE
4	GROUND
5	GROUND
6	RED GROUND
7	GREEN GROUND
8	BLUE GROUND
9	NC
10	GROUND
11	GROUND
12	NC
13	**HORIZONTAL SYNC.
14	**VERTICAL SYNC.
15	NC

#### SIGNAL LEVEL

\* . . . 0.7Vp-p (video).

\*\* . . . TTL

NC . . . NON-CONNECTION

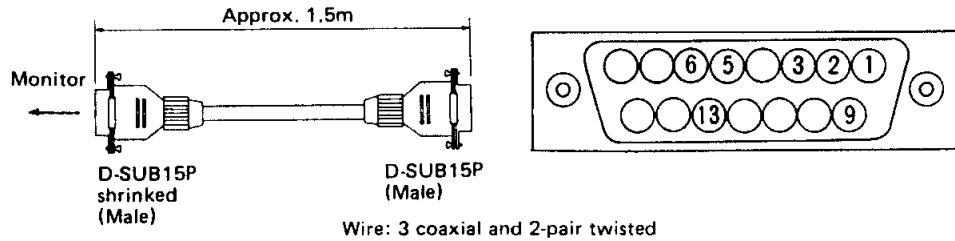
# APPENDIX B STANDARD SIGNAL CABLE

MEMO

## OPTION

TYPE: CABLE-FA4 (FOR MACII and IGS)

### PIN ASSIGNMENT AND SIGNAL LEVEL



SIGNAL PIN ASSIGNMENT	ANALOG
1	RED GROUND
2	*RED
3	**COMPOSITE H&V SYNC.
4	NC
5	*GREEN (Note: with Sync serrations)
6	GREEN GROUND
7	NC
8	NC
9	*BLUE
10	NC
11	NC
12	NC
13	BLUE GROUND
14	NC
15	NC

#### SIGNAL LEVEL

\* . . . 0.7Vp-p (video).

\*\* . . . TTL

NC . . . NON-CONNECTION